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THE GOVERNANCE OF AGRICULTURE: GLOBAL PROGRAMS OF
DEVELOPMENT AND AGRICULTURAL BIOTECHNOLOGY

by

Kelly Greenfield

A Thesis

Submitted to the Faculty of Graduate Studies and Research
through Sociology
in Partial Fulfillment of the Requirements for
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ABSTRACT

In the name of progress and growth, the apparatus of development has formed a mode of global governance. This apparatus consists of development discourses and institutions and attempts to govern agriculture, pointing to the current effort underway to liberalize agriculture on a global scale. Farmers of the developing world are now subject to a regime of control that includes international institutions of governance, nation-state governments and multinational corporations. By examining the role of specialized agencies of the United Nations, specifically the FAO and UNESCO in the governance of agricultural practices, I focus on the implementation and management of agricultural biotechnology and genetic engineering in the farming practices of the rural peoples in the developing world. I specifically examine the extent to which the concept of expert knowledge has influenced the incorporation and development of agricultural biotechnologies into these farming practices. Based on my analysis, I illustrate how the FAO and UNESCO, through their reliance upon professional forms of expert knowledge, facilitate the global management of agricultural practices.

DEDICATION

This thesis is dedicated to my Mom and Dad, Marlene and Doug Greenfield. There are really no words to express how thankful I am for your continuous support, encouragement and love, and especially for your advice for me to always “live my dreams”.

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INTRODUCTION

Finally, for the majority of the world's population, food is not just an item of consumption, it's actually a way of life. It has deep material and symbolic power. And because it embodies the links between nature, human survival and health, culture and livelihood, it will, and has already, become a focus of contention and resistance to a corporate takeover of life itself (McMichael, 2000:31-2).

A new technology of agriculture based on biotechnology and genetic engineering is threatening to alter food and agricultural production practices on a global scale. The collapse of the Bretton Woods institutions¹ in the 1970s signaled a transitional period of global agricultural market restructuring, resulting in shifts in the regulation of both food production and food consumption (Goodman and Watts, 1997). This new food regime is dominated by international institutions, world markets and innovative, ever-changing scientific technologies, all of which have drastic consequences for small-scale rural farmers in the developing world. While supporters praise the benefits of biotechnology and genetic engineering for addressing food insecurity and malnutrition, opponents counter that these technologies will lead to the further destruction of the environment, that they will increase poverty and hunger and will lead to the corporate hijacking of traditional agriculture and the global food supply.

In the name of progress and growth, the apparatus of development has formed a mode of global governance. My conceptualization of apparatus of development refers to

¹ The Bretton Woods institutions were formed as a result of the US-led 1944 Bretton Woods conference that sought to establish a framework for post-war recovery and order. The institutions established at this conference include the World Bank, the International Monetary Fund and the World Trade Organization.

the assemblage of political and economic rationalities that shape the discourses and practices of development and that “systematically relates forms of knowledge and techniques of power” (Escobar, 1995: 10) to these discourses and practices. Various agents, institutions and actors thus interact to form the apparatus of development. The current effort to liberalize trade and agriculture on a global scale is exemplified in the attempt to govern agriculture via institutions and discourses of development (McMichael, 2000; Rose, 1999; Gupta, 1998). Farmers of the developing world are subject to a regime of control that includes international institutions of governance, nation-state governments and multinational institutions.

In this study, I focus on the implementation and management of agricultural biotechnology and genetic engineering in the farming practices of the rural peoples in the developing world². I investigate how international development institutions, specifically the Food and Agricultural Organization of the United Nations (FAO)³ and the United Nations Educational, Scientific and Cultural Organization (UNESCO)⁴, and their

² I deliberately avoid using the term “Third World” to refer to the collective “South” and instead prefer to use the term “developing world”, which is more widely accepted.

³ The United Nations Food and Agricultural Organization was founded in 1945. An intergovernmental organization, FAO has 187 member countries plus one member organization, the European Community, as of December 3rd, 2003 (FAOa).

⁴ The United Nations Educational, Scientific and Cultural Organization (UNESCO) was founded on November 16th, 1945. At the time of this research study, it consists of 191 Member States and six associate Members in the fields of education, science, culture and communication (UNESCOa).

discourses attempt to govern the agricultural practices of rural farmers through the incorporation and use of various biotechnologies. I specifically examine the extent to which the concept of expert knowledge has influenced the incorporation and development of agricultural biotechnologies into these farming practices; that is to say, how does expert knowledge, as I contend is intrinsic to the policies and practices of the FAO and UNESCO, attempt to define and control agricultural practices on a global scale? Based on my analysis, I illustrate how these governing agencies, in combination with other interested actors in the global capitalist economy, have indeed facilitated the global management of agricultural practices by means of the reliance on professional forms of expert knowledge.

METHODOLOGY

Various international agencies have initiated global programs in order to manage and direct agricultural production. My research study examines the ways in which agricultural practices in the developing world are governed by the FAO and UNESCO. Through a qualitative research design employing discourse analysis as a methodology, I critically assess FAO and UNESCO documents, publications, reports and policy papers in order to reveal the ways in which these international institutions attempt to define and control global agricultural production practices via the incorporation of biotechnologies. This stage of my research activity involves the collection and analysis of secondary data derived from the publicly available information contained on the FAO and UNESCO websites. Additionally, I undertake a detailed and extensive review of the current activities and programs of both institutions with the intent of revealing various

global technologies of government, which I maintain are deeply embedded within the governing practices of these institutions. The analysis and interpretation of the information found on these websites demonstrates how expert knowledge shaped within the FAO and UNESCO attempts to define and control agricultural practices on a global scale.

Social reality is produced through discourses, thereby making it impossible to fully understand social interactions without reference to the discourses that give them meaning (Phillips and Hardy, 2002). As a qualitative methodology that interprets language and text, critical discourse analysis is a useful technique used in the analysis of documents, projects, programmes and policies. The aim of critical discourse analysis is to illustrate the ambiguous ways in which language and text are implicated in social relations of power and domination, as well as in ideology (Fairclough, 2001). Critical discourse analysis concentrates on the function of discursive activity in both creating and sustaining unequal power relations, and therefore it “should describe and explain how power abuse is enacted, reproduced or legitimated by the talk and text of dominant groups and institutions” (van Dijk, 1996; 84).

In order to understand how the FAO and UNESCO exert power whilst governing agricultural practices via the utilization of expert knowledge associated with agricultural biotechnologies, my research investigates the main concepts utilized within the text of the mission statements, mandates, programmes and strategic plans of these particular governing agencies. As these texts relate to agricultural biotechnologies, the intent of this research project is to investigate the discursive techniques employed by the FAO and UNESCO in their attempt to change the agricultural practices of rural farmers in the

developing world. This information is found on web pages directly linked to the respective home pages of the FAO and UNESCO, and provides the general information required to navigate to the more deeply embedded documents I discuss. In an attempt to decode the text, I interrogate the main areas of expertise specifically relating to key concepts, and explore the ways in which the FAO and UNESCO are communicating these concepts.

The documents and programs of interest to my research include but are not limited to the FAO's Statement on Biotechnology, the Biotechnology in Food and Agriculture Series, FAO: Agriculture 21 On-Line Magazine and the FAO-BioDeC, a database with the intent to gather, store, organize and disseminate information about crop biotechnology products and techniques within the developing world. Furthermore, this research study will explore the UNESCO/Biotechnology Action Council (BAC) Programme, UNESCO's Science for the Twenty-first Century: A New Commitment Press Kit as well as UNESCO's International Centre for Genetic Engineering and Biotechnology, a centre which promotes the 'safe' use of biotechnology with special regard to the needs of the developing world. These are important documents because they are the main sources from which these governing agencies disseminate their information to their member countries, various stakeholders and the public in general. In addition to the FAO and UNESCO websites, I will rely on other relevant websites such as that of the Convention on Biological Diversity, the United Nations and the Codex Alimentarius in order to support my claims.

In an effort to investigate the various forms of rationalities, knowledges and strategies that are employed by the FAO and UNESCO in negotiating and managing

farming practices through the implementation of biotechnology and genetic engineering, I develop an analysis that is informed theoretically by studies on governmentality and globalization. I draw on the work of Michel Foucault and his studies on power and knowledge and rely on the insights of Nikolas Rose and other scholars who work in the area of expertise and governance, as well as authors such as Akhil Gupta and Arturo Escobar for their research on globalization and development. In the following section I develop a conceptual framework focusing on governing through biotechnology by investigating discourses of development and expert knowledge as well as globalization and global technologies of government. Through the collection and analysis of various documents and programs, I aim to investigate the discursive techniques employed by the FAO and UNESCO in their attempt to govern the agricultural practices of rural farmers in the developing world, and to suggest how the economic interests of corporate agents relate to the FAO's and UNESCO's expert knowledges and governance techniques.

CONCEPTUAL FRAMEWORK

Governing Through Biotechnology

For my research, I examine the discursive practices of international institutions of development through a theoretical framework based on governmentality literatures. An analysis of governance in relation to the economic rationalities of capitalism and the economic interests of other actors (such as multinational seed producing companies) is important because it provides a more comprehensive understanding of how and why the conduct of rural farmers becomes reconfigured and regulated with global capitalist relations of power through the programs and policies of international institutions of development. Foucault's insight into the dynamics of discourse and power in the

representation of social reality has played a critical role within the social sciences. In developing his discourse theory, Foucault questioned how specific forms of knowledge and theory became possible. His conception of discourse illustrates that the terms we employ in speaking, writing and thinking about our world reflect upon wider relations of power, and are therefore important in sustaining power structures (Gardner and Lewis, 1996; Hunt and Wickham, 1994). Foucault maintained that these discourses of power have a tendency to construct their subjects in specific ways in order to exercise power over them (Foucault, 1980; See also Hunt and Wickham, 1994; Escobar, 1995; Gardner and Lewis, 1996; Rose, 1999). I contend that the creation and utilization of this power vis-à-vis biotechnological practice is a tool used to govern rural farmers in the developing world.

Gardner and Lewis consider development itself to be a hegemonic discourse, one in which “Third World peoples are objectified, ordered and controlled” (1996: 75). In an attempt to break free from the dominant discourse, they suggest we challenge the key assumptions maintained by the apparatus of development. Similarly, Arturo Escobar concludes that development discourse has “created an extremely efficient apparatus for producing knowledge about, and the exercise of power over, the Third World” (Escobar, 1995: 9). He observes that in order to ensure a certain control over the developing world, this apparatus has successfully deployed a regime of government, a “space for ‘subject peoples’” (ibid). Furthermore, the apparatus of development has generated a professionalized mode of thinking, including an assortment of concepts, categories and techniques “through which the generation and diffusion of particular forms of knowledge are organized, managed and controlled” (Escobar, 1995: 6). In their roles as global

development institutions, the FAO and UNESCO function as agencies intended for knowledge production and dissemination, as well as agencies used to exercise power over peoples in the name of progress.

The influence of science and technology has a long history in the shaping of agricultural practice, from the centuries-old practice of plant hybridization or cross-breeding to the more modern version of genetic engineering and biotechnology. A technology, from the governmentality perspective, refers to a collection of forms of knowledge with various devices, techniques, tactics and strategies which have a tendency to produce certain outcomes (Rose, 1999). The Convention on Biological Diversity (CBD) defines biotechnology as: “Any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use” (The Convention on Biological Diversity, 2005). The science-based transformation of developing world agriculture and the resulting incorporation of the specific form of technology identified as biotechnology has not only restructured rural agricultural practices, but it has resulted in drastic consequences for many rural farmers (Altieri, 2000; Leisinger, 2000; Shiva, 2000; Lague, 2002; McMichael, 2002). Technological innovations such as biotechnology and genetic engineering employed in capitalist and globalized settings have the potential to estrange people from each other, while facilitating a shrinking of time-space distances and impacting on the way people experience their everyday lives as well as on the way they are governed (Bauman, 2000; Giddens, 1990). The adoption of genetically modified seeds from the global market into the agricultural production practices of rural farmers, as endorsed by various international institutions, consequently takes away the control of

farmers over their own seeds, threatening the livelihoods of these farmers. According to Vandana Shiva, “biotechnology can thus become an instrument for dispossessing the farmer of seed, as a means of production” (Shiva, 1991: 245).

We are currently experiencing a significant shift in the ways in which the value of knowledge and knowledge exchange are regarded in relation to farming and food production practices. For thousands of years, the genetic materials of seeds and plants have been collected, stored and shared by local communities. Over the last 20 years, botanists, plant breeders and biotechnologists, as experts in their field, have been systematically collecting germplasm and storing it in genebanks. This practice of biodiversity prospecting perpetuates the employment and institutionalization of intellectual property rights (IPRs), which focus on protecting corporate or individual knowledge

The notion of expert knowledge has influenced the incorporation and development of biotechnological practices in the agricultural field of both the developed and developing world. Knowledge is increasingly circulated through “enumeration, calculation, monitoring and evaluation” (Isin, 2000: 155) and is understood “not simply as ‘ideas’, but refers to the vast assemblages of persons, theories, projects, experiments and techniques” (Rose and Miller, 1992: 177). In their discussion of expert knowledge, Rose and Miller maintain:

Government is intrinsically linked to the activities of expertise, whose role is not one of weaving an all-pervasive web of ‘social control’, but of enacting assorted attempts at the calculated administration of diverse aspects of conduct through countless, often competing, local tactics of education, persuasion, inducement, management, incitement, motivation and encouragement (1992: 175).

The use of expert knowledge is often a neo-liberal strategy employed in order to govern individual conduct and characteristics of populations (Rose and Miller, 1992; Rose, 1993, 1999). International institutions of development rely on professional forms of expert knowledge, such as that of biotechnologists, genetic engineers, scientists, policy advisors, agronomists, statisticians and other professionals in order to shape and guide both social and economic conduct with regards to agricultural biotechnology on a global scale. This reliance may be demonstrated through the collection, analysis and dissemination of data that is considered to aid development.

International development institutions and organizations have a long history of setting goals by targeting new technologies in order to achieve their long-term goals. For example, one of the eight United Nations Millennium Development Goal (MDG) is to “Eradicate extreme poverty and hunger by the year 2015” (United Nations, 2005) and is dependent on professional forms of expert knowledge, which are embedded within its various agencies, in the propagation of an international sustainable agriculture strategy. This international sustainable agriculture strategy which endorses the implementation of various agricultural biotechnologies is eerily reminiscent of the introduction of the Green Revolution⁵ as a development model, with its goal of modernizing and developing the

⁵ ‘Green Revolution’ is the name given to the science-based transformation of Third World agriculture, a scientific experiment in development and agricultural transformation in the post WWII decades. “The Green Revolution has been heralded as a political and technological achievement, unprecedented in human history. It was designed as a strategy for peace, through the creation of abundance by breaking out of nature’s limits and variabilities” (Shiva, 1991: 21).

agricultural sectors of developing world countries. During the Green Revolution, the focus on development was meant to mobilize these countries out of a colonial agricultural regime as quickly as possible and thus embrace the techniques and practices of agricultural industrialization. Similar to the contemporary discourses of international institutions of development, these former discourses of development played an integral role in the construction of national policies and practices. Furthermore, both periods of agricultural restructuring were reliant upon professional forms of expert knowledge to both produce and disseminate knowledge and practices aimed at shaping the conduct of rural farmers. As a modernization strategy, the Green Revolution claimed that the package of agricultural innovation would cure global hunger and an attempt was made to mold small rural farmers into commercial farmers (Perkins, 1990; Shiva, 1991, 1997; Escobar, 1995; Gardner and Lewis, 1996; Altieri, 2000; Leisinger, 2000). Vandana Shiva has argued that the Green Revolution was developed as a political tool leading to the reorganization of agricultural systems aimed at transcending scarcity and creating abundance, and simultaneously involved a restructuring of the way power was distributed in society (Shiva, 1991, 2000; See also Escobar, 1995; Altieri, 2000; Leisinger, 2000). She argues that this experimentation in development and agricultural transformation resulted, however, in political and ecological tragedy while attempting to dominate the systems and practices of rural farmers: "Control over nature and control over people were essential elements of the centralized and centralizing strategy of the Green Revolution" (Shiva, 1991: 15).

As development efforts aim to expand agricultural production, we are witness to the increasing global management of food and agriculture. The apparatus of

development has formed a mode of global governmentality, consisting of development discourses and institutions and attempting to govern agriculture, pointing to the current effort underway to liberalize agriculture on a global scale and for global purposes (Rose, 1999; Gupta, 1998). International institutions of development, and their approaches to agriculture aimed at eradicating world hunger, have initiated global programs in order to manage and direct agricultural production. As stated by Ilcan and Phillips, these processes of globalization “depend upon professional expertise and techniques to produce knowledge geared toward governing social and economic conduct” (2003: 442). The development programs initiated by international institutions of development aimed at expanding agricultural production via the incorporation of biotechnologies may be considered examples of what Nikolas Rose would term ‘technologies of government’, which he defines as:

an assemblage of forms of practical knowledge, with modes of perception, practices of calculation, vocabularies, types of authority, forms of judgment, architectural forms, human capacities, non-human objects and devices, inscription techniques and so forth, traversed and transected by aspirations to achieve certain outcomes in terms of the conduct of the governed (Rose, 1999: 52).

Ilcan and Phillips further this definition by establishing that in an attempt to manage so-called underdevelopment, the apparatus of development has subjected many agricultural regions of the developing world to various “global technologies of government” (2003: 448). Similar to Rose’s conception of technologies of government, global technologies of government not only shape, guide and direct conduct, but they too rely on experts and expertise. The difference becomes apparent by the fact that global technologies of government function on a global scale rather than at the level of the nation-state in order to intervene upon and shape the conduct of the governed. In fact, various international

institutions of development concentrate their attention on the modern global understandings of agricultural production and food consumption with the expectations of attaining food security on a global scale. The discourses and practices of international institutions of development, nation-state governments and transnational corporations, and their combined regime of control have subjected rural farmers in the developing world to the global standardization of Western scientific practices.

Akhil Gupta describes this combined governance as a new “regime of domination and management”, which in the case of India has simply replaced “the explicit administrative and economic control exercised during official colonialism” (1998: 10). High-tech methods of farming and production and the explicit role of transnationals in this system of production has resulted in a mode of governance in the developing world that transcends, yet relies upon the involvement of, the state and international institutions (Gupta, 1998:14-15). The United Nations and its governing agencies play a pivotal role in this agricultural restructuring process, which may be evidenced by the various programmes and recommendations involving biotechnologies aimed at eradicating world hunger. The current restructuring of global agriculture practices signals a fundamental political process at work, “a widespread subordination of producing regions to global production and consumption relations organized by transnational food companies” (McMichael, 2000: 23). As a result of the incorporation of rural farmers into a global regime of trade governance, they must now abide by the rules of intellectual property rights governed by the multinational seed-producing companies and agree not to save or recycle the genetically modified seeds harvested in previous seasons, or else suffer the consequences of the criminalization of traditional seed-sharing and seed-saving

practices⁶. This not only drastically alters their entire agricultural production system, but creates a new dependence on these seed companies for their livelihoods (see for example Shiva, 1991; McMichael, 2000; Altieri, 2000; Gupta, 1998).

Multinational biotechnology corporations seek to create international seed markets, whereby once diverse commodities are becoming increasingly standardized, illustrating the homogenizing impact of the West-dominated international market and, consequently, of new technologies involved in food production and consumption. Seed technology has had an enormous homogenizing impact on developing world agricultural practices whereby farmers in developing countries are increasingly steered into integrating genetically modified seeds from multinational corporations, by international institutions of development, in place of local seed varieties with promises of increased yields as well as both drought and disease resistance (Gupta, 1998; Lague, 2002; Paarlberg, 2001; Shiva, 2000; Magdoff et al, 2000). The adoption of this agricultural production practice not only promotes a reliance on these global corporations, resulting in disempowerment and subordination of rural farmers, but it also has the potential to foster genetic homogeneity and crop uniformity. Additionally, since genetically

⁶ The criminalization of the traditional seed-sharing and seed-saving practices of rural agricultural farmers in the developing world (Shiva, 2000) is a direct result of the World Trade Organization's (WTO) Trade Related Intellectual Property Rights Agreement (TRIPS), and agreement reached after the completion of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994. The consequences of the criminalization of these practices, although significant, are beyond the scope of this thesis.

modified seeds are corporately controlled and protected by intellectual property rights and patents, which makes them expensive to purchase, these various biotechnologies endorsed by most international institutions of development will inevitably serve to further the marginalization of rural farmers (Altieri, 2000; Magdoff et al, 2000; McMichael, 2000; Pinstup-Andersen and Schioler, 2000; Shiva, 1991).

Genetically modified seeds have the potential to wipe out indigenous species of crops that have thrived for centuries (Altieri, 2000; Paarlberg, 2001; Shiva, 2000). The marketing strategies of multinational biotechnological seed manufacturing corporations seek to create an international market for a single commodity. This impacts not only the type of crops grown, whereby once diverse farms now only monocrop, but also the methods used to farm them become standardized (Shiva, 2000). Here, we see this notion of standardization in production and consumption practices come to fruition. As a result, multinational agricultural companies like Monsanto, Cargill, ConAgra and Dupont, become actors whose influence in shaping and directing the development policies of international institutions of development, such as the FAO and UNESCO, comes into being. In this manner, the world food market has come to be guided primarily by these multinational corporations (McMichael, 2000) as well as international institutions of development.

ANALYSIS

Biotechnological Development in a Globalizing Era: An Analysis of the FAO and UNESCO

The founding of a permanent organization for food and agriculture in 1943 brought together forty-four governments to work for a common cause; to help build “a

world without hunger” (FAOf, 2005). The first session of FAO Conference took place in 1945 in Quebec City, Canada, which established the FAO as a specialized agency of the United Nations. Working for both developed and developing countries, the FAO leads international efforts to eradicate world hunger, functions as a source of knowledge and information, and operates as a neutral forum where all countries convene as equals to debate policy and negotiate agreements (FAOg, 2005).

Representatives of thirty-seven countries assembled in London, England in 1945 to sign UNESCO’s Constitution which was enacted in 1946 after ratification by twenty signatories (UNESCOe, 2005). In this current era of globalization, the unifying theme of UNESCO today is to contribute to peace and human development through education, the sciences, culture and communication (UNESCOf, 2005). According to the Constitution, the purpose of the Organization is:

To contribute to peace and security by promoting collaboration among nations through education, science and culture in order to further universal respect for justice, for the rule of law and for the human rights and fundamental freedoms which are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations (UNESCOg, 2005).

In this section, I demonstrate how the FAO and UNESCO aim to expand agricultural production with the expectation of attaining global food security by employing various global technologies of government and associated expert knowledges, in an attempt to assist the global management of agricultural biotechnological practices.

Expert knowledge, as an apparatus of development, is embedded within complex power/knowledge relationships of the United Nations. In order to exercise various programmes and rationalities, the FAO and UNESCO rely on specific forms of expert

knowledge, such as statistics and census, which result in the production and dissemination of knowledges that aim to govern economic, cultural and social conduct. Both FAO and UNESCO rely heavily on numbers and statistics as technical devices used to quantify, calculate and produce a certain type of objectivity, revealing the fact that both agencies are deeply involved in a “discourse of calculation” (Ilcan and Phillips, 2003:447). This may be exemplified by the FAO’s State of Food and Agriculture 2003-2004 (SOFA) report subtitled: Agricultural Biotechnology: Meeting the needs of the poor? (FAO, 2003-2004). For example:

“Transgenic crops were grown commercially in 18 countries on a total of 67.7 million ha in 2003, an increase from 2.8 million ha in 1996 (Figure 4). Although this overall rate of technology diffusion is impressive, it has been very uneven. Just six countries, four crops and two traits account for 99 percent of global transgenic crop production (Figures 5-7) (James, 2003)” (FAO, 2003-2004).

Here we see numbers, percentages, rates and figures, all telling a story, shaping identities and rendering the subject knowable and calculable (Rose, 1999: 113). Statistics here are understood as “techno-representations endowed with complex political and cultural histories” (Escobar, 1995: 213). Throughout the entire report we see a heavy reliance on numbers and statistics, graphs, tables and charts used to illustrate their attempt to end global hunger by managing agricultural productivity. As evidenced by their use of statistics within this publication, the FAO has set out a number of goals and targets concerning the exploration of the potential for agricultural biotechnology to meet the needs of the world’s poor and food-insecure. The result of this type of quantification is both a standardized object and standardized subject of measurement (Rose, 1999:207).

This standardizing tendency may also be exemplified by the FAO and UNESCO's support of the Codex Alimentarius Commission⁷ for food standards. According to the FAO's Statement on Biotechnology;

Together with the World Health Organization, FAO provides the secretariat to the Codex Alimentarius Commission which has just established an ad hoc Intergovernmental Task Force on Foods Derived from Biotechnologies, in which government-designated experts will develop standards, guidelines or recommendations, as appropriate, for foods derived from biotechnologies or traits introduced into foods by biotechnological methods (FAOd, 2004).

An appraisal of the discourses and practices of the FAO and UNESCO illustrates that although the motivation of the corporate regime is profit while the goal of these agencies is progress, they do share similarities to that of the corporate regime and function as promoters or managers of a homogeneous model of globalization. For example, UNESCO "functions as a laboratory of ideas and a standard-setter to forge universal agreements on emerging ethical issues" (UNESCOa, 2005). Likewise, the FAO plays a rapidly growing role as a standard-setting authority. According to Louise O. Fresco, head of the FAO's Agricultural Department, "the more you globalize, the more you leave the market free, the more you need to regulate it", therefore the role of the FAO is "in advising the middle group of countries, in shaping the thinking of the richer countries, and protecting the most vulnerable at the bottom end of the scale" (FAOb, 2004). The FAO's role in "advising, shaping and protecting" various developed

⁷ The Codex Alimentarius Commission was created in 1963 by FAO and WHO to develop food standards, guidelines and related texts such as codes of practice under Joint FAO/WHO Food Standards Programme.

and developing countries is an example of a global technology of government, where the aspiration to achieve certain outcomes is in terms of the conduct of the governed (Rose, 1999).

Within the United Nations, attention is concentrated on the modern global understandings of agricultural production and food consumption practices with the expectations of attaining food security on a global scale. This process was to occur, and largely has occurred, however, on the basis of the creation of homogeneous sites and western scientific practices as part of the process of global standardization. The FAO's mode of governance provides experts to develop standards and standard-setting authorities, guidelines and recommendations, agreements as well as acting as an "honest broker" by providing a forum for discussion (FAOd, 2004). It is evident that the FAO views itself or tries to give the impression that its role is as mediator, an agent who has no agenda of its own. However it is the FAO who directs or steers these discussions. Both the FAO and UNESCO host electronic forums (FAOi, 2005 and UNESCOh, 2005) with the aim of "providing quality balanced information on agricultural biotechnology in developing countries and to make a neutral platform available for people to exchange view and experiences on this subject" (FAOi, 2005). It is important to keep in mind both the limited availability and use of this form of information and communication technology, given the large marginalized populations who may not have the privilege of using this type of technology.

The various elements of FAO's program on biotechnology are co-coordinated by an Inter-departmental Working Group on Biotechnology (IDWGB) which has developed a program based on internal inter-disciplinarity and external partnership (FAOj, 2005).

This vast network of experts and professional knowledge ensures the shaping of what becomes knowable and calculable to the development institutions, which may be demonstrated by the following quote found on the FAO's Activities in the Field of Biotechnology:

In line with its mandate, FAO can provide, on request, policy advice for biotechnology issues related to food and agriculture and technical assistance on specific technologies and legal and technical advice on regulatory aspects to its members. FAO will also promote information dissemination and continue to monitor new developments and potential impacts of the adoption of biotechnology" (FAOj, 2005).

Likewise, UNESCO "collaborates with governments, other UN specialized agencies, with scientific and technical organizations and a wealth of intergovernmental and non-governmental organizations in pursuit of its goal: to act as a global promoter or clearing house for scientific and technical knowledge" (UNESCOb, 2004). UNESCO's mission in science is accomplished in part through the use of 'networks';

Networking is a way of connecting scientists who best know the needs of their region in their particular fields. By supporting – and creating – regional and sub-regional networks, UNESCO is able to foster regional scientific research, reduce the sense of isolation often felt by researchers in developing countries, disseminate information and generally upgrade the level of hundreds of scientists in the Third World (UNESCOd, 2004).

A result of this partnership is that information sharing becomes self-referential or circular in nature. UNESCO's reliance on information generated by the FAO reflects this tendency, which I argue privileges specific sources of knowledge and information. This is further exemplified in the footnotes of a press kit published on UNESCO's website which reads:

UNESCO, in association with United Nations Environment Programme (UNEP), The Food and Agricultural Organization (FAO), The International Cell Research Organization (ICRO) and other non-

governmental organizations, has set up a world-wide network of specialized research and training institutions called MIRCENs (Microbial Resources Centres) to promote the preparation and use of cheap biological fertilizers (UNESCOb, 2004).

Similarly, the FAO supports the establishment of effective partnerships with the aim to enhance global food security and improve living standards in developing countries:

FAO's comparative advantage in such partnerships lies in its intergovernmental status, its direct links with public and private entities in member countries, and its comprehensive experience in the agricultural sector...this comparative advantage provides a basis for FAO to foster international information exchange via networks involving members' institutions, international bodies, academic centres, NGOs and the private sector (FAOe, 1999).

Through the provision of technical information and assistance, furthered by socio-economic and environmental analyses on major global issues related to new technological developments, the FAO "assists developing countries to participate more effectively and equitably in international commodities and food trade" (FAOd, 2004). These partnerships have the tendency to simultaneously create new inequalities, new opportunities and new risks, and emphasizes that certain domains have been organized at the global level. This may be exemplified by reviewing many of UNESCO's programmes and policies, which are aimed at "bridging the scientific and technological differences existing between developed and developing countries" (UNESCOc, 2004). It therefore becomes clear that both the FAO and UNESCO employ these technologies of government which lend support to biotechnology and genetic engineering as scientific innovation and expertise, which have been partly responsible for the production of global knowledge of food and agricultural practices.

With the goal of unifying the agricultural sector and guiding national action on the policies and methods required to achieve sustainable agriculture, the FAO has

proposed “Good Agricultural Practices” as a “way of translating all the wishful thinking on sustainable agriculture into very concrete recommendations for countries and production systems” (FAOb, 2004). The goal of FAO’s Good Agricultural Practices (GAP) approach is to increase farmer’s incomes from existing markets and “take advantage of new market opportunities” (FAOk, 2005). This is to be done through practices that increase productivity, that protect the environment, ensure the safety and quality of food, and involve the adoption of a “range of integrated technologies” (FAOk, 2005). What appears on this website is that the FAO’s programmes for sustainable agriculture and rural development are responding to new challenges and targets. What is not said is that the above mentioned integrated technologies involve various agricultural biotechnologies for sustainable agriculture, supporting the FAO’s commitment to science-based evaluation procedures involving various expert knowledges.

Thousands of rural farmers across the globe have owned, controlled and shared their own seed stocks for centuries, whereas in the present stage of modernity we see these farmers becoming simply a new market for the genetically modified seed products of transnational biotechnological corporations. The FAO views its efforts in incorporating its member countries, especially developing countries, into this global market as “assistance” in “reap(ing) the benefits derived from the application of biotechnologies in agriculture” (FAOd, 2004). In discussing the value of biotechnology specifically “test tube plants” or “vitroplants”, UNESCO demonstrates that “The flower market is enormous. Even poor countries have become major producers of vitroplants” (UNESCOb, 2004). As Bauman might argue, these rural farmers have become global citizens, a people whose history and cultural legacy has been forgotten in favor of the

marketized strategies of the global elite (Bauman, 2000). This is in complete contrast to the view taken by Albert Sasson, Doctor of Natural Sciences and Special Advisor to the Director-General of UNESCO who claims that “most biotechnologies pose no ethical or social problems and are useful”(UNESCOb, 2004). He goes on to say; “For example by using micro-propagation you can make thousands of identical plants and can supply agriculture with potatoes, strawberries and so on all year round” (UNESCOb , 2004). By incorporating standardized agricultural practices involving biotechnologies, as recommended by experts from various international development agencies, including the FAO and UNESCO, the peoples in agricultural regions of production continue to be subordinated by the relations of global production and consumption.

As a social, cultural and political process, globalization is constructed by relationships of power, regulation and control, “an uneven process in which there are, as it were, winners and losers” (Tomlinson, 1999: 97). McMichael has extended this claim by arguing that globalization is a higher-ordered version of the development project (2000). In questioning whether biotechnology will exacerbate current inequalities in the world, the FAO admits;

What we are witnessing is a molecular divide between developed and developing countries, between rich and poor farmers, between research priorities and needs, between technology development and technology transfer – in short, between the promise of biotechnology and its real impact (FAOc, 2004).

The current restructuring and standardization of global agricultural practices highlight the fact that there exists an unequal relationship between the world’s food producers and consumers. This is where the United Nations ‘progressive’ role is becoming increasingly important, in bridging this gap between the rich and the poor. Multinational seed

companies have the tendency to subordinate farmers to the relations of global production and consumption, thereby intensifying the global division of labour (McMichael, 2000). Furthermore, the marketing strategies of transnational biotechnological seed manufacturing corporations seek to create an international market for a single commodity, resulting in a product that tends to not only foster genetic homogeneity, but also standardize the methods used in farming practices on a global scale (Altieri, 2000; Shiva, 2000). This unequal relationship raises the question of the association between indigenous knowledges and the expert knowledge in contemporary, late-capitalist world. It seems contradictory that the surge of interest in indigenous knowledge⁸ within the last two decades has accompanied the geographic expansion and restructuring of capitalist processes, so that the marginal groups in rural agricultural areas are increasingly drawn into the agenda of capitalist production and consumption.

The system of relations established between international institutions of governance, social and economic processes, technological factors and forms of knowledge define the conditions under which terms, objects, thoughts, theories and strategies can be incorporated into discourse (Escobar, 1995). The agricultural biotechnology industry is one of the world's most rapidly growing sectors whose

⁸ A conceptualization of 'indigenous knowledges and practices' has been created as a polar opposite to those conceptualized as 'Western'. This concept of 'indigeness' is used and applied to products for commercial value in that it is intended to signify a particular connection to nature, ecology, spirituality and health. In this way the concept and label of 'indigenous' is made a commodity which can be bought and sold throughout the global capitalist economy.

research and development is primarily taking place within the private sector with a goal to regulate and control agricultural production on a global scale. Plant breeding and genetically modified seed crops have become big business dominated by a few multinational mega-corporations who seek to hijack centuries of knowledge and collective innovation by farmers (Shiva, 2000; McMichael, 2000). The current restructuring of global agricultural practices and the subsequent homogenizing impact on these farming practices highlights the role of the FAO and UNESCO as standard-setters promoting generalized practices and universal agreements regarding agricultural biotechnologies borrowed from the biotechnology industry. The FAO and UNESCO act as global managers of agricultural practices by means of a reliance on a professional form of expert knowledge and its role in implementing biotechnologies into existing rural agricultural practices.

CONCLUSION

Contemporary western systems of knowledge and information flows render the subject of information as merely the object. Integral to this process of displacing the subject's power to that of merely object within the informational framework of modernity is the process of precluding any information that falls outside of a given hierarchy of expert knowledge. The technological knowledge of the 'expert' is often valued over the indigenous knowledge of the 'other' within conservative international discourses of development, although it is important to note that the United Nations does conduct a good deal of research on indigenous knowledge. However, discourses of development have relied almost exclusively on Western systems of knowledge, reflecting

a prevalence of modernist rationality. Current development practices are demonstrating that we cannot divorce our research from the everyday context, as the problems associated with 'developing' are specific in their complexity to a particular time and space (See Escobar, 1995; Gardner and Lewis, 1996; Smith, 1999).

As mentioned previously, the FAO and UNESCO's mode of governance provides experts to develop standards and standard-setting authorities, guidelines, recommendations and agreements. By providing technical information and assistance, furthered by socio-economic and environmental analyses on major global issues related to new technological developments, the FAO "assists developing countries to participate more effectively and equitably in international commodities and food trade" (FAOa, 2004), thereby assuming that these countries, and by extension the individual farmers actually want or need to participate in these globalized, Western systems of trade.

If we re-examine Nikolas Rose's basic definition of governance, it becomes apparent that this concept offers vital insight into the effects of contemporary globalization on the peoples of the agricultural regions of the developing world as well as the governance of their agricultural practices. Rose writes:

Governance directs attention to the nature, problems, means, actions, manners, techniques and objects by which actors place themselves under the control, guidance, sway and mastery of others, or seek to place other actors, organizations, entities or events under their own sway (1999: 16).

Considering that much of what UNESCO does is concerned with "education, training and capacity building, focusing on advanced training for scientists from developing countries" (UNESCOd, 2004), my review indicates that the foundation of UNESCO's system of governance is in accordance with Rose's definition. This system of transferring knowledge highlights a core and periphery structure of knowledge, whereby

scientists from developing countries are provided “with the continuing education and skills that they need to enable them, once returned home, to continue their teaching and research in the native lands” (UNESCOd, 2004). It is therefore imperative that we examine globalization, as processes and their effects, through a governance framework that demonstrates how knowledge, particularly expert knowledge, is produced and disseminated within these processes.

By combining governmentality literature with the work of global institutions of development and their relationship to farming practices in the developing world, this research study provides a unique investigation into the governance of agricultural biotechnology and genetic engineering in these farming practices. Throughout this research, I have focused on the extent to which expert knowledge, in combination with the workings of the global market, has influenced the incorporation of these biotechnologies, by concentrating on the role of international institutions of governance, specifically the Food and Agricultural Organization and the United Nations Educational, Scientific and Cultural Organization, and their international approach to agricultural practices aimed at eradicating world hunger. The framework of governance has informed this research study in an attempt to understand how processes and institutions involved in development and globalization have attempted to govern the everyday lives and agricultural practices of rural farmers in the developing world. The conduct of these farmers seems to be shaped, guided and directed (Rose, 1999:3) by the governance of international organizations such as the FAO and UNESCO and transnational corporations.

By exploring how processes of standardization, homogenization, commodification, knowledge production, knowledge and information sharing and partnerships occur, it is possible to more easily understand how the interactions between the FAO and UNESCO, farmers of the developing world and corporate actors work to create global capitalist relations of power. Through technologies of governance, the conduct of these farmers becomes regulated so as to reconfigure them as consumers and as agents of the apparatus of development within those capitalist relations.

Through my research I have found that there has not been a critical examination of the relationship between the concepts of expert knowledge and global technologies of government in connection with the FAO or UNESCO in the area of agricultural biotechnology. The research I have conducted in this study highlights the influence of these agencies of the United Nations in governing agricultural production practices. Additionally, my research exposes the growing trend toward a standardized agricultural practice as well as a globalized knowledge system by using the FAO and UNESCO as examples of standardizing governing agencies promoting the use of agricultural biotechnologies as forms of expert knowledge. I believe that my findings will contribute to broader understandings of the apparatus of development, specifically the various ways in which farming practices in the developing world are governed by the strategies and rationalities, or technologies of government utilized by the FAO and UNESCO.

REFERENCES

- Altieri, M. A. (2000) "No: Poor Farmers Won't Reap the Benefits." *Foreign Policy* 119: 123-131.
- Bauman, Z. (2000) *Liquid Modernity*. Cambridge: Polity Press.
- Beck, U. (2000) *What Is Globalization?* Cambridge: Polity Press.
- Convention of Biological Diversity (2005) "Convention on Biological Diversity" On-line Resource: <http://www.biodiv.org/convention/articles.asp?lg=0&a=cbd-02> (accessed 22/07/2005).
- Escobar, A. (1995). *Encountering Development: The Making and Unmaking of the Third World*. Princeton: Princeton University Press.
- FAOa (2005) "FAO Governing Bodies" On-line Resource: http://www.fao.org/unfao/govbodies/memberships3_en.asp (accessed 14/07/2005).
- FAOb (2004) "Agriculture 21: Shaping the future of agriculture" On-line Resource: <http://www.fao.org/ag/magazine/0301sp1.htm> (accessed 26/02/2004).
- FAOc (2004) "Agriculture 21: A new social contract on biotechnology" On-line Resource: <http://www.fao.org/ag/magazine/0305sp1.htm>. (accessed 26/02/2004).
- FAOd (2004) "Biotechnology in Food and Agriculture: FAO Statement on Biotechnology" On-line Resource: <http://www.fao.org/biotech/stat.asp>. (accessed 26/02/2004).
- FAOe (1999) Committee on Agriculture: Fifteenth Session Rome, 25-29 January 1999, Red Room. Biotechnology. On-Line Resource: <http://www.fao.org/unfao/bodies/COAG/COAG15/X0074E.htm>. (accessed 26/02/2004).
- FAOf (2005) FAO at Work: A short history of FAO. On-line Resource: http://www.fao.org/UNFAO/about/history_en.html. (accessed 11/08/2005).
- FAOg (2005) FAO at Work: Home. On-line Resource: http://www.fao.org/UNFAO/about/index_en.html. (accessed 11/08/2005).
- FAOh (2003-2004) "Agricultural Biotechnology: Meeting the needs of the poor?" In, *The State of Food and Agriculture 2003-2004 (SOFA)* <http://www.fao.org/docrep/006/Y5160e06.htm>. (accessed 11/08/2005).
- FAOi (2005) Biotechnology in Food and Agriculture: Electronic Forum. On-line Resource: <http://www.fao.org/biotech/forum.asp?lang=en>. (accessed 15/08/2005).

FAOj (2005) FAO's Activities in the Field of Biotechnology. On-line Resource: <http://www.fao.org/biotech/act.asp>. (accessed 27/06/2005).

FAOk (2005) Good Agricultural Practices and SARD. On-line Resource: <http://www.fao.org/ag/magazine/0504sp3.htm>. (accessed 01/07/2005).

Fairclough, N. (2001) The Discourse of New Labour: Critical Discourse Analysis. In Wetherell, M, Taylor, S. and Yates, S. (eds.), *Discourse as Data: A Guide for Analysis* (pp. 229-266). London: The Open University.

Foucault, M. (1980). *Power/Knowledge*. New York: Pantheon Books.

Gardner, K. and Lewis, D. (1996). *Anthropology, Development and the Post-modern Challenge*. Sterling: Plato Press.

Giddens, A. (1990). *The Consequences of Modernity*. Stanford: Stanford University Press.

Goodman, D. and Watts, M.J. eds.(1997) *Globalizing Food: Agrarian Questions and Global Restructuring*. London: Routledge.

Gupta, A. (1998) *Postcolonial Developments: Agriculture in the Making of Modern India*. Durham: Duke University Press.

Hunt, A. and Wickham, G. (1994). *Foucault and Law: Towards a Sociology of Law as Governance*. Chicago: Pluto Press.

Iltan, S. and Phillips, L. (2003) "Making Food Count: Expert Knowledge and Global Technologies of Government." in *The Canadian Review of Sociology and Anthropology*. 40 (4): 441-461.

Isin, E. (2000) "Governing Cities without Government." In Isin, E. (ed.), *Democracy, Citizenship, and the Global City* (pp. 148-68). London and New York: Routledge

Lague, D. (2002). "The Promise of Food Security." in *Far Eastern Economic Review*. 165(13): 34-48.

Leisinger, K. M. (2000). "Yes: Stop Blocking Progress." in *Foreign Policy*. 119: 113-122.

Magdoff, F., Bellamy Foster, J. and Buttel, F. (2000). *Hungry for Profit: the Agribusiness Threat to Farmers, Food, and the Environment*. New York: Monthly Review Press.

McMichael, P. (2000) "The Power of Food." *Agriculture and Human Values* 17: 21-33.

- Paarlberg, R. (2001) *The Politics of Precaution: Genetically Modified Crops in Developing Countries*. Baltimore: The Johns Hopkins University Press.
- Perkins, J. H. (1990) "The Rockefeller Foundation and the Green Revolution, 1941-1956." in *Agriculture and Human Values* 7: 6-18.
- Pinstrup-Andersen, P. and Schioler, E. (2000). *Seeds of Contention: World Hunger and the Global Controversy Over GM Crops*. Baltimore: The Johns Hopkins University Press.
- Phillips, N. and Hardy, C. (2002) *Discourse Analysis: Investigating Processes of Social Construction*. Thousand Oaks, CA: Sage.
- Ritzer, G. (1998) *The McDonaldization Thesis*. London: Sage Publications.
- Rose, N. and Miller, P. (1992) "Political Power Beyond the State: Problematics of Government" in *British Journal of Sociology* 43(2): 173-205.
- Rose, N. (1993) "Government, Authority and Expertise in Advanced Liberalism" in *Economy and Society* 22(3): 283-299.
- Rose, N. (1999) *Powers of Freedom: Reframing Political Thought*. Cambridge: Cambridge University Press.
- Shiva, V. (1991). *The Violence of the Green Revolution: Third World Agriculture, Ecology and Politics*. New Jersey: Zed Books Ltd.
- Shiva, V. (1997) *Biopiracy: The Plunder of Nature and Knowledge*. Cambridge: South End Press.
- Shiva, V. (2000) *Stolen Harvest: The Hijacking of the Global Food Supply*. Cambridge: South End Press.
- Smith, D. (1999) *Writing the Social: Critique, Theory, and Investigations*. Toronto: University of Toronto Press.
- Tomlinson, J. (1999) *Globalization and Culture*, Chapter 3 ('Global Culture: Dreams, Nightmares, and Scepticism'). University of Chicago Press. Pp. 71-105.
- UNESCOa (2005) "About UNESCO: What is it" On-line Resource:
http://portal.unesco.org/en/ev.php-URL_ID=3328&URL_DO=DO_TOPIC&URL_SECT... (accessed 10/05/2005).

UNESCOb (2004) "Science for the twenty-first century: A New Commitment-Biotechnology-solution or problem?" On-line Resource:
<http://www.unesco.org/bpi/science/content/press/anglo/13.htm>. (accessed 08/02.2004).

UNESCOc (2004) "Biotechnology/Life Science" On-line Resource:
http://www.unesco.org/en/ev.php@URL_ID=6474&URL_DO=DO_PRINTPAGE&UR.
(accessed 18/02/2004)

UNESCOd (2004) "Science for the twenty-first century: A New Commitment-Science at UNESCO" On-line Resource:
<http://www.unesco.org/bpi/science/content/press/anglo/1.htm> (accessed 15/02/2004).

UNESCOe (2005) UNESCO Milestones. On-line Resource:
http://portal.unesco.org/en/ev.php-URL_ID=14606&URL_DO=DO_TOPIC&URL_SECTION=201.html. (accessed 11/08/2005).

UNESCOf (2005) About UNESCO: Strategy. On-line Resource:
http://portal.unesco.org/en/ev.php-URL_ID=6331&URL_DO=DO_Topic&URL_SECTION=201.html. (accessed 11/08/2005).

UNESCOg (2005) Constitution of UNESCO. On-line Resource:
http://portal.unesco.org/en/ev.php-URL_ID=6206&URL_DO=DO_TOPIC&URL_SECTION=201.html. (accessed 11/08/2005).

UNESCOh (2005) Communication and Information Communities. On-line Resource:
<http://portal.unesco.org/ci/forum/ubbthreads.php>. (accessed 15/08/2005).

United Nations (2005) "UN Millennium Development Goals (MDG)" On-line Resource:
<http://www.un.org/millenniumgoals/> (accessed 07/24/2005).

Urry, J. (2000) "Global Flows and Global Citizenship," in E. Isin, ed., *Democracy, Citizenship and the Global City*. London: Routledge.

van Dijk, T.A. (1996) Discourse, Power and Access. In Caldas-Coulthard, C.R. and Coulthard, M. (eds.), *Texts and Practices* (pp. 84-104). London: Routledge.

Walters, R. (2004). "Criminology and Genetically Modified Food", *British Journal of Criminology*. 44 (2): 151-167.

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